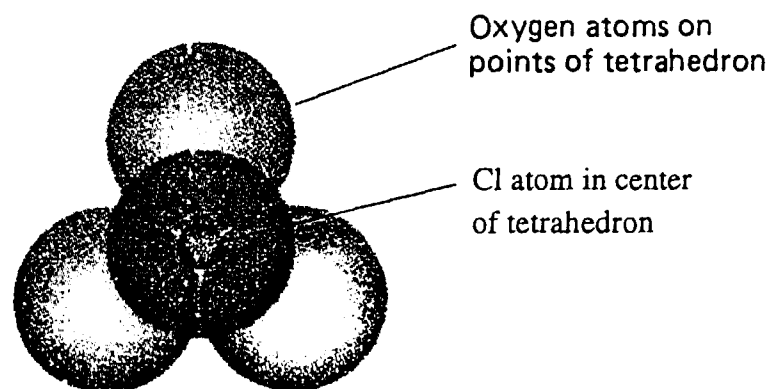
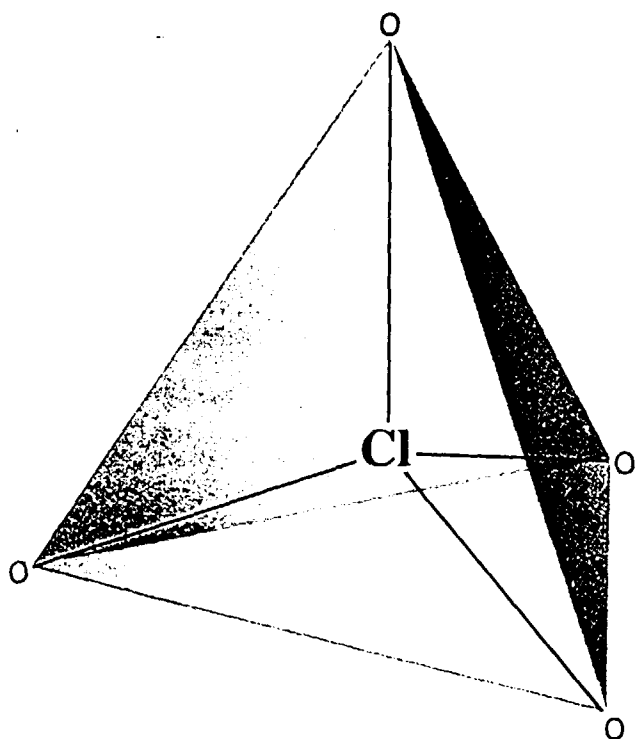


Perchlorate



Perchlorate ClO_4^-

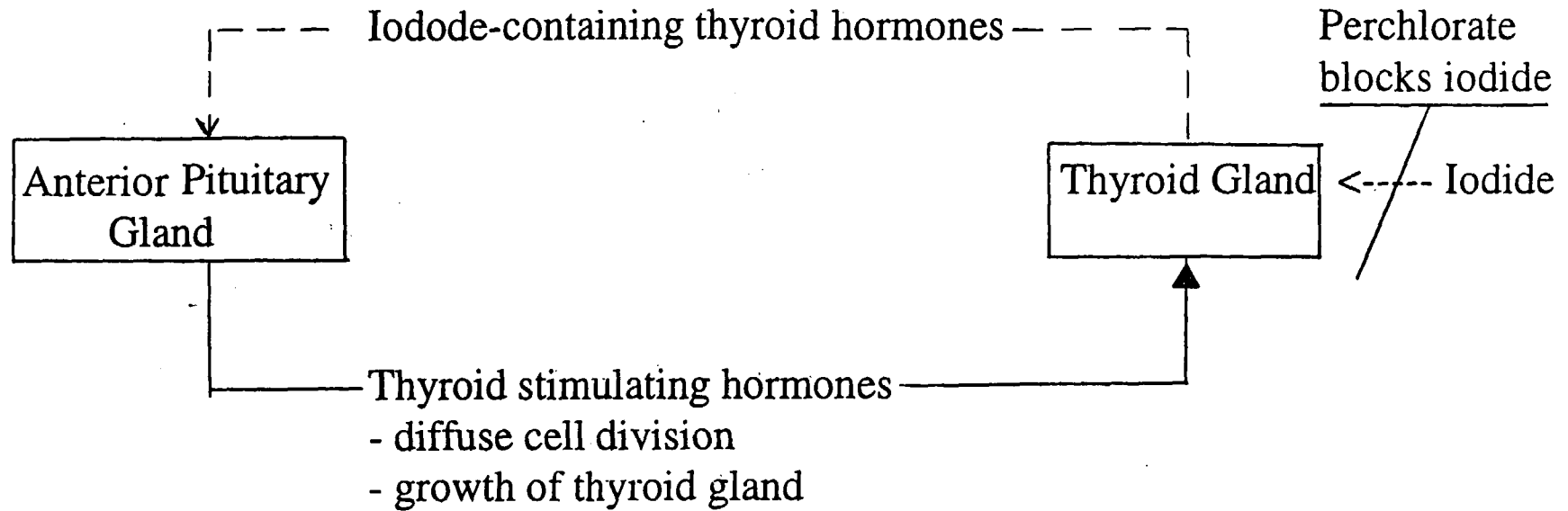
Usage: Perchlorate compounds widely used as solid rocket propellants, ignitable sources in munitions and fireworks

No MCL Only Provisional RfD: 1 to 5 E-4 mg/kg/day = 3.5 to 17.5 ppb USEPA
92 & 95 review by National Center for Environmental Assessment

Toxicity Data in Humans:

- 1) Non-cancer: Perchlorate causes early manifestation of thyroid-pituitary disturbance. Perchlorate competitively inhibits the uptake of iodide into the thyroid inhibiting the production of iodide-containing thyroid hormones. The absence of iodide-containing hormones from the thyroid causes the anterior pituitary gland to produce thyroid stimulating hormones which cause diffuse cell division and growth of the thyroid gland. The thyroid pituitary disturbance is reversible when the source of perchlorate is removed.
- 2) Cancer: Data suggests that long-term interference with the thyroid-pituitary axis can lead to tumors (thyroid follicular cell neoplasia). The provisional RfD prevents the thyroid-pituitary disturbance from occurring and will protect against cancer.

Thyroid-Pituitary Disturbance



EPA vs. TERA Uncertainty Factors

LOAEL 1.4 mg/kg/day from Stanburg & Wyngaarden Study (1952)
Acute study

92-95 97

EPA	TERA	Uncertainty Factors
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10	03	(H) Human Variability
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01	01	(A) Inter-Species Variability
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10	03	(S) Subchronic-to-Chronic Extrapolation
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03 to 10	03	(D) Insufficient Database
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01	03	(L) LOAEL TO NOAEL Extrapolation
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300 to 1000	81~100	Max or Default setting is 10,000
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01	01	(MF) Modifying Factor
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Detect Limit: Aerojet has improved their detection limit from 400 ppb to 100 ppb which is above the provisional RfD of 3.5 to 17.5 ppb.

Perchlorate Problem: Detected 2/10 in five drinking water wells

- Arden Cordova Water Service 12,000 connections affected

o Well 1014 220 ppb Off-line 2/11

o Well 1015 Trace 65 to 95 ppb Off-line 2/11

o Well 1016 220 ppb Off-line 2/11

- Sacramento County's Sunrise Water Maintenance District 350 connections affected

o Well 1030 280 ppb Off-line 2/28

o Well 1097 Trace 93 ppb Off-line 2/28